Professors Bring Real-World Experience to Classroom  By David Rattigan

When three electrical engineering professors at Merrimack want to blend classroom theory with real-world applications, they can find examples in their own catalogue of work. During successful careers in industry, professors Daniel O’Brien, Sam Biller, and Vance Poteat played a role in the design of many items used in everyday life, from Caller I.D. to the 911 emergency system.

All three Merrimack professors hold patents on devices that may be found in your home. O’Brien, associate professor of electrical engineering, was a system designer and engineer on the first 911 project, and Biller, associate professor of electrical engineering, whose circuit boards were important in the history of long-distance telephone technology — holds a patent on a "pre-distorter" utilized by the CATV industry, which minimizes non-linear distortion in lasers.

While at Bell Laboratories, Poteat, now in his third year as an assistant professor, designed items such as cordless phones, speaker phones, digital cable boxes, routers, and universal remote controls. One of his specialties was to redesign products to make them affordable, a competitive imperative in the consumer electronics field. Poteat admits to getting a little kick from walking into Radio Shack or another appliance store and seeing his work displayed on the shelves.

Poteat worked on early-stage optical transmission equipment, and helped design the first video telephone on the consumer market. His team holds a patent on digital cable television anti-pirating technology, and perhaps most significantly, a patent on telephone technology that uses hardware, software and a display unit that will spell out the name of an incoming caller. That technology is part of the "Caller I.D." system.

In the early ’80s, Poteat's team was working on the first "digital telephone," which they felt would become a household item in the 1990s. They were wrong. Although most of the signal in a telephone line travels digitally, from telephone pole to handset, most still use the "analog" system created by Alexander Graham Bell. Poteat’s job was to design what was called the "Calling Party I.D." The patent he has now is used by those who modified the system to work in analog telephones, creating the "Caller I.D." so popular today. "We didn’t realize how much people would like it," Poteat said. "We considered it a secondary feature at the time."

At New England Telephone in the late 1960s, O’Brien designed the nation’s first 911 emergency call system. As part of that system, he developed the concept of "forced disconnect" (dispatchers can disconnect if there’s an attempt to tie up multiple lines), and "caller party hold" which allows police to lock onto a line and trace it.

"Over the 27-plus years I spent in industry, I’d say I have developed and designed hundreds of systems with perhaps 10 to 15 designs with patentable concepts and/or applications," said O’Brien, who has been teaching at Merrimack for 20 years. He also holds a copyright on software written for the United Nations, which allowed remote tax database data to be retrieved remotely on distributed Novell LAN platforms.

As part of the team that designed parts of the long-haul telephone network system for AT&T and the Federal Aviation Administration, Biller knows that for years most long-distance calls were transmitted over circuits he designed. The FAA used a similar system for its backbone communication network, providing safety for the flying public. Among projects he worked on were over 29 years at Bell Labs, in addition to digital radio systems, was piezoelectric timing devices and fiber optic transmission for the CATV industry.

Biller has also been teaching at Merrimack for 20 years. Like his colleagues, he enjoys teaching in a college environment, and believes that the experience he gained in his field has made him a better teacher.

"It gives us the ability to let the students know what the real world is like," he said. "That really benefits the students."

Poteat noted that Merrimack has a diverse engineering faculty, and that the mix of instructors with strong academic credentials and industry experience is welcomed, with the emphasis for both groups to pass on their knowledge to students.